



Michael J. Spence, Ph.D.

Las Cruces, NM 88013

Tel:

E-mail:

Affidavit: Supporting New Trial in State of Washington v. Thomas T. Aranda

Michael J. Spence, Ph.D., Spence Forensic Resources

I. Introduction

1. I, Michael J. Spence, Ph.D., have worked as a scientist for over 40 years. For nearly 20 years, I have functioned as an expert in forensic biology/DNA *both* as a law enforcement scientist as well as an independent consultant. In my expert opinion, the DNA results from the analysis exculpate Mr. Aranda. The detection of his DNA on one sample collected from the alleged victim was a likely consequence of nothing more than the unreliable procedures utilized by the State's forensic analyst—including unnecessary risks of DNA contamination.

II. Summary of Qualifications

2. I received my Bachelor of Science and Master of Science degrees in Microbiology from the University of Texas at El Paso in 1983 and 1985, respectively. In December 1990, I earned my doctorate degree in Molecular Biology from New Mexico State University. From 1991 through early 2003, I worked in DNA research—predominantly cancer research—at the University of Vermont-Department of Molecular Genetics (Burlington, VT), and the Boise V.A. Medical Center (Boise, ID).
3. From May 2003 through May 2007, I trained and worked as a Forensic Biologist with the Indiana State Police (ISP), Evansville Regional Laboratory. For the next eight months, I served as the interim Technical Manager of Forensic Testing Laboratories (FTL), a start-up forensic DNA analysis company—located in Las Cruces, New Mexico.
4. In February 2008, I resigned from FTL, and founded Spence Forensic Resources. For nearly fifteen years, I have provided services as a Forensic DNA Consultant—here in Las Cruces, New Mexico. I have reviewed about 1250 cases involving forensic biology and DNA. These cases have originated out of 100 different forensic DNA laboratories located in thirty-three U.S. states. I have been qualified and I have testified as an expert DNA witness in 166 trials/hearings in Indiana, New Mexico, Texas, Arizona, Maryland, Colorado, Michigan, South Carolina, Florida, California, Iowa, Oklahoma, Louisiana, Arkansas, Idaho, and Alaska. My Curriculum Vitae is provided (**Exhibit 1**).

5. The Thomas Aranda case was first brought to my attention on August 23, 2022. On October 12, 2022, I spoke with Mr. Craig D. Suffian, pro bono counsel for Mr. Aranda. The case circumstances were summarized as follows: On April 25, 2008, a home invasion occurred at a residence located in Chelan County, Washington. The purpose was to burglarize the location, targeting drugs, the proceeds from drug transactions, and other valuables. The occupants of the residence were as follows: [REDACTED] his girlfriend, [REDACTED] and [REDACTED]. Due to the fact that the intruders were all wearing hoods and face coverings, it was challenging to identify—with certainty—one perpetrator from another. [REDACTED] She described her attacker as 5'7 or 5'8, medium build; Mr. Aranda was approximately 6'0 and 210 pounds.
6. Mr. Suffian expressed an interest in utilizing my expertise in forensic biology/DNA to examine various documents. These documents included, but were not necessarily limited to the following: Chelan County Sheriff's Office evidence item lists, and requests for DNA analysis, Laboratory Reports—dated July 8, 2008, and November 6, 2008—released by the Washington State Patrol Crime Laboratory (WSPCL), analyst bench notes, case communication logs, worksheets from various stages of forensic processing, including DNA extraction, DNA quantification, DNA typing, and DNA mixture analysis. After completing my examination of these documents, I was asked to summarize my opinion on the integrity and reliability of the scientific casework conducted by the WSPCL.
7. The following is my expert opinion: ***The forensic DNA results from analysis in WSPCL No. 208-000821 substantially exonerated Mr. Aranda. The data failed to demonstrate any definitive indication that he sexually assaulted Ms. [REDACTED]*** This conclusion is founded principally upon the documents generated by the WSPCL—as follows:

III. Initial Round of Washington State Patrol Crime Lab Analysis

8. On April 25, 2008, a Sexual Assault Nurse Examination (SANE) was promptly conducted on Ms. [REDACTED]. According to the July 18, 2008, WSPCL Report prepared by forensic analyst, Anna Ballard (**Exhibit 2**), five SANE intimate items were collected from Ms. [REDACTED] and subjected to an initial round of forensic examination. As the oral swabs tested negative for seminal material and failed to show the presence of sperm cells, no further testing was conducted on those swabs. As examination of the labial, vaginal, and anal swabs from Ms. [REDACTED] established the presence of sperm cells, Ms. Ballard proceeded further with DNA typing from those swabs. An item labeled as '**Skin Swabs**' from Ms. [REDACTED] was found to reveal only one sperm cell. Ms. Ballard conducted no further testing on those swabs. Based upon the observation of sufficient sperm cells from the labial, vaginal, and anal swabs, there was sufficient cause to believe that the source of male DNA from those intimate areas could be from the boyfriend, Mr. [REDACTED] or DNA from the male intruder who allegedly assaulted the victim, or even a mixture of genetic material from those two individuals.

- 9.** Page 1 of 40 of the analyst bench notes is entitled “CASE CONVERSATION LOG” (**Exhibit 3**). The first entry on this page, recorded at 8:51 a.m., on July 23, 2008, was five days after the release of Ms. Ballard’s first report on her initial round of testing. The message reads as follows: **“Will send in Reference from boyfriend and the underwear from the main suspect (Aranda). Victim says anal sex lasted the longest. Asked if I would screen underwear.”** This entry established that a DNA reference swab from Mr. [REDACTED] would soon be obtained. Most important, the communication log entry exposed a troubling assumption—that Thomas Aranda was already considered as the **“main suspect,”** within a case that did not yet include **any DNA results**. Refer also to the Request for Laboratory Examination (**Exhibit 4**), prepared on May 7, 2008, by Detective Marv Jeffries. This document includes the revelation: **“Suspect Aranda, Thomas is our probable rapist.”** This seems, at least in part, attributable to Chelan County Sheriff’s Officer Mark Hegberg’s faulty notion that Mr. Aranda was about 5’8, and considerably lighter than 210 pounds.
- 10.** After Ms. Ballard received a pair of red shorts (**Item 30**), added entries on **Page 1 of 40** of her notes (**Exhibit 3**) were documented between July 31, 2008, and August 14, 2008. This revealed the vital fact: **“The shorts were worn under the suspect’s jeans. [REDACTED]** [REDACTED]
[REDACTED] All forensic biology experts are fully aware that human saliva, anal secretions, and fecal matter are remarkably rich in an enzyme called ‘amylase’. On **Page 3 of 5** of the July 18, 2008, WSPCL report (**Exhibit 2**), Ms. Ballard refers to the oral and penile swabs collected from Thomas Aranda. Defying explanation, the penile swabs were never tested for the possible presence of salivary amylase/anal amylase from the alleged assault of Ms. [REDACTED]. Most intriguing, the penile swab from Thomas Aranda failed to show so much as a hint of DNA from either the victim, or Mr. [REDACTED]. Keeping this in mind, sixteen weeks after the July report from Ms. Ballard, her subsequent analysis, in part, ***did*** focus on an attempt to detect amylase on the underwear/shorts (**Item 30**)—collected from Thomas Aranda.

IV. Second Round of Washington State Patrol Crime Lab Analysis

11. **Page 1 of 40** of Ms. Ballard's bench notes, the CASE CONVERSATION LOG (**Exhibit 3**), shows entries spanning September 19, 2008 through the end of October 2008, related to an expected report on "**Request 0004**". This second round of analytical results remained pending over a prolonged time frame—until eventually released on November 6, 2008 (**Exhibit 5**). DNA typing from the boyfriend—Mr. [REDACTED] that he was the *only* sperm cell/DNA contributor to the labial swabs and vaginal swabs collected from Ms. [REDACTED]. Vastly more illuminating are the amylase test results from the underwear/shorts worn by Mr. Aranda. Refer to **Page 5 of 40** of Ms. Ballard's bench notes (**Exhibit 6**). Interestingly, the amylase plate diffusion test targeting the entire inside front area of Thomas Aranda's underwear/shorts demonstrated a *complete absence of saliva, a complete absence of anal secretions, and a complete absence fecal matter from Ms. [REDACTED]*
12. **How the WSPCL amylase test works:** Amylase is an enzyme produced by the salivary glands and pancreas. Amylase aids digestion of starches and other carbohydrates. It traverses

16. An argument could also be constructed that once the invaders exited the home, the perpetrator of the sexual assault could have changed his underwear and/or washed his genital area. This notion also defies logic, as it completely contradicts the reported facts—as well as the timing of the events. Less than five minutes elapsed between the entry and exit of the residential intruders. Within minutes after the home invasion, Ms. [REDACTED] was being transported away from the residence—for further interviews and examinations. Only 1½ blocks away from the residence, the victim pointed out that the perpetrators were still present, right there in the neighborhood. The five suspects were promptly confronted and apprehended by law enforcement officers approximately six minutes after the initial entry.
17. Those apprehended with juvenile Mr. Aranda (date of birth [REDACTED] were: [REDACTED] and [REDACTED]. Officers collected Mr. Aranda's clothing immediately after bringing him to the juvenile detention facility. He was placed in an observation cell and not allowed to shower until after he was brought to the medical facility for collection of his penile swabs. It is noteworthy that Mr. Aranda was the **"main suspect"/"our probable rapist"**. Parallel with this conclusory characterization, Mr. Aranda and Mr. [REDACTED] were the only two suspects from which penile swabs were collected. Those penile swabs, **Item 5P** and **Item 7P**, were both typed for DNA. Both failed to reveal any hint of genetic material from Ms. [REDACTED] or from Mr. [REDACTED]. Also consistent with the faulty, premature assumptions of guilt, Mr. Aranda's underwear was the ***only*** garment collected from ***any*** of the suspects. The fact that three sources of DNA were processed from Mr. Aranda—his oral swabs, his penile swabs, and his shorts/underwear—constitutes dangerous risk factors for potential cross-contamination events during the crime lab processing of the intimate SANE items from Ms. [REDACTED]. In line with this, note that the DNA present on the oral reference swabs from Thomas Aranda was quantified at **9000 nanograms (ng)**. In 2008, this was sufficient DNA to achieve genetic typing results from the young suspect—***9000 times over***. The penile swab collected from Thomas Aranda also provided an elevated yield of DNA—in the amount of **152 ng**.

V. Unnecessary Risks of Contamination During Evidence Processing

18. Refer to the **"Conclusions"** section on **Page 2** of Ms. Ballard's November 6, 2008, WSPCL Report (**Exhibit 5**). From the anal swabs collected from Ms. [REDACTED] the analyst reported that there **"...is a mixture of at least three individuals."** While assuming the presence of Ms. [REDACTED] and her boyfriend, Mr. [REDACTED], Ms. Ballard reported that Mr. Aranda could not be excluded as an additional contributor to this DNA mixture.
19. It is important to refer to **Page 9 of 82** of Ms. Ballard's bench notes dated **"6/9/08"** (**Exhibit 8**). Midway down this page, Ms. Ballard noted that she handled two **"oral swabs"** collected from **"Thomas Aranda"** and that approximately **"½ of one of the swabs was removed, placed into a tube labeled 'TA'"**. Subsequent bench notes established that—on that same day, June 9, 2008—she extracted DNA from ½ of one of the two oral swab reference standards from Mr. Aranda. The total DNA yield was estimated at **2271 ng**. It is important to emphasize that the entirety of combined DNA from Thomas Aranda, on those two oral swabs, can be estimated at over **9000 ng**. Oral swabs are extremely rich with DNA.

20. Now refer to **Page 5 of 82** of the bench notes, showing the date, **"6/11/08"** (**Exhibit 9**). This was only two days after handling an ultra-rich DNA source from the **"main suspect"**—Thomas Aranda. Near the bottom of the page, Ms. Ballard noted that she handled two **"Anus"** swabs and two **"Anal folds"** swabs, both collected during Ms. [REDACTED] SANE examination. The analyst also noted that **"1/4 of each swabs was removed, combined into a tube labeled 'Anal'".** It is entirely improper for any crime lab analyst to—first—handle the DNA-rich reference samples from a suspect, and extract the substantial amount of DNA that is guaranteed to be present. Then—subsequent to that process—the same analyst begins handling key evidence samples, upon which there will be a search for DNA from that same, primary suspect. Evidence processing in this fashion introduces an **enormous risk of potentially catastrophic cross-contamination events**. Best practices dictate that all of the key evidentiary samples should be extracted for DNA, quantified, and typed for DNA results—prior to any handling of known reference samples.
21. Recall that, near the bottom of **Page 5 of 40** of Ms. Ballard's bench notes (**Exhibit 6**), she described that **"An amylase map was performed on the inside front crotch area..."** of Mr. Aranda's underwear. While **two** amylase map tests revealed **zero** amylase present, the garment was undoubtedly heavily laden with DNA from the wearer—Mr. Thomas Aranda. It is noteworthy that Ms. Ballard handled those shorts/underwear on July 29, 2008. On the very next day, July 30, 2008, she also conducted a DNA extraction from Ms. [REDACTED] anal swabs—see **Page 8 of 40** of Ms. Ballard's bench notes (**Exhibit 10**). Two days later, on August 1, 2008, **Page 15 of 40** of Ms. Ballard's bench notes (**Exhibit 11**), she conducted the typing process on those anal swabs. Five days after that, Ms. Ballard repeated the 2nd series of amylase map tests on the shorts/underwear collected from the accused man—Thomas Aranda. This progression of processing steps was **contrary to guidelines**.
22. Refer to the January 2017 document released by the **Scientific Working Group on DNA Analysis Methods (SWGDM)**. This profoundly informative publication bears the title: **"Contamination Prevention/Detection Guidelines for Forensic DNA Laboratories"** (**Exhibit 12**). **SWGDM Guideline 2.1.2** advises crime lab managers and bench scientists that: **"Reference samples should be processed separately from evidentiary items by area and/or time."** Also within these guidelines, refer to **Pages 5-8**, and the multitude of references that the SWGDM scientists make, regarding **"ventilation"**, **"air flow"**, and the importance of liquid **"aerosols"**, during the processing of DNA within forensic lab facilities.
23. The SWGDM Guidelines were echoing a document released in September 2011, by the Federal Bureau of Investigation (FBI). This eleven-year-old FBI document was entitled: **"Quality Assurance Standards for Forensic DNA Testing Laboratories."** As of July 1, 2020, the FBI standards have been updated with the modified title: **"Quality Assurance Standards for DNA Databasing Laboratories"** (**Exhibit 13**). Refer to **Section 7. Facilities and Sample Control**. Subsections 7.1.2 and 7.1.3 emphasize the importance of conducting DNA processes while using **"separate times"** or **"separate spaces"**. Most important, the FBI emphasizes, **"The doors between rooms containing amplified DNA and other areas shall remain closed except for passage."** Thus, Ms. Ballard clearly did not adhere to the guidelines as outlined by SWGDM, or as defined by the FBI.

VI. Doubtful integrity of the WSP Crime Lab Evidentiary Conclusions

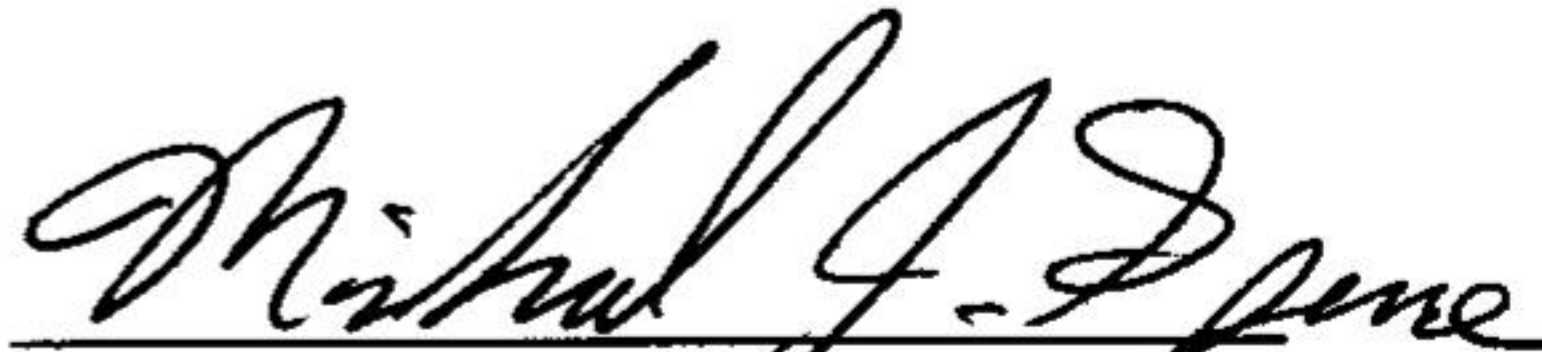
24. Added to the lack of compliance with the published SWGDAM/FBI guidelines/standards, numerous other factors undermine the scientific reliability of the WSPCL case analysis:
- Refer to the case notations dated May 8, 2008, upon which various case evidence items arrived at the WSPCL—lacking proper labels, case numbers, and initials (**Exhibit 14**). Most importantly, numerous items were improperly sealed. The note reads: **“Proper seals were added to all 14 items. The 4 envelopes and 8 swab boxes were incorrectly dated as being sealed on 05-30-08.”** This late May date was obviously incorrect—as the case notes were compiled twenty-two days earlier. These errors impacted any DNA extraction and analysis from the very beginning;
 - Dating back to early 2008, there is an absence of documentation regarding how long Anna Ballard had been employed as a WSPCL DNA analyst, her qualifications, or how long she continued to conduct forensic DNA casework;
 - Ms. Ballard’s bench notes from July/early August of 2008 were numbered consecutively, from page **“1 of 40”** through page **“25 of 40”**. In the absence of any documented explanation, page **“26 of 40”** was changed to page **“54 of 92”**. Also without any noted explanation, the **“92”** was crossed out and changed to an **“82”**. A multitude of subsequent **“92”** notations were also crossed out and changed to an **“82”**. This puzzling lack of attention to a coherent numbering system indicates that some documentation of analytical processes, proper dates, and/or scientific results may have been lost or omitted;
 - Refer to **Page 5 of 82** of Ms. Ballard’s bench notes (**Exhibit 5**). On June 11, 2008, she **“combined”** cuttings from Ms. [REDACTED] internally-collected **“Anus”** swabs with her externally-collected **“Anal folds”** swabs. These items should have been utilized for DNA extraction separately, rather than combining material from two distinct intimate areas; and
 - Aligned with the troubling evidence handling and potential contamination of the anal swab samples, refer to the e-mail addressed to Ms. Anna Ballard, from Dr. Gary Shutler, the WSPCL DNA Technical Leader dated August 11, 2008, at 5:01 p.m. (**Exhibit 15**). In part, Dr. Shutler refers to a portion of the anal swab results as **“very convincing”**, whereas another portion of the results **“...are not as clear.”** More alarming, Dr. Shutler further points out that: **“There is something strange with the proportion of the second male at D16.”** Still further, the WSPCL DNA Technical Leader refers to various unexplainable peak height imbalances, stating that: **“it may be just a quirky amp result.”**
25. An alternate hypothesis to these seemingly benign **“quirky”** results is that Ms. Ballard began with the preconceived notion of Mr. Aranda as the **“probable rapist”**. Keeping that in mind, she committed the grave error of handling his **9000 ng** of his oral swab DNA, plus **152 ng** of his penile swab DNA, plus a likely elevated quantity of ***more*** DNA present on his shorts/underwear (**Item 30**). These decisions constituted a profoundly misguided and deficient analytical strategy and process in attempting to test for Mr. Aranda’s DNA within Ms. [REDACTED] intimate anal swab DNA sample.

VII. Summary and Conclusions

26. Thomas Aranda was among five suspects who were apprehended within minutes after the April 25, 2008, home invasion. Although he was rapidly designated as the “probable rapist”, the WSPCL analyst, Anna Ballard, reported a ***complete absence*** of the amylase enzyme, or any foreign DNA, on his shorts/underwear and the perplexing ***absence*** of any amylase map/diffusion plate examination of the penile swab from Thomas. Considering that the only DNA on the juvenile’s penile swab was found to be Thomas, himself, the above-described findings must be assessed as ***profoundly contradictory to the allegations that Thomas engaged in sexual contact***. It is also notable that the inner surfaces of the shorts/underwear collected from Thomas were—mysteriously—never subjected to any DNA typing. Even further, Ms. Ballard reported ***no DNA*** from the young man on Ms. [REDACTED] SANE kit vaginal swabs, oral swabs, labial swabs, or skin swabs. Although the analyst reported the three-way mixture on the anal swabs—which included DNA consistent with Mr. Aranda—Ms. Ballard disregarded best practices—as outlined by the published SWGDAM Guidelines, and the FBI Standards. She went beyond these confounding errors by opting to work with ***limited separation of space/time*** between the evidence samples and the **9000 nanograms** of DNA, plus **152 nanograms** of DNA collected from Thomas. Ms. Ballard also handled his shorts/underwear—in search of amylase—the very day prior to handling the anal swabs samples that were essential toward charging the suspect with the sexual assault.

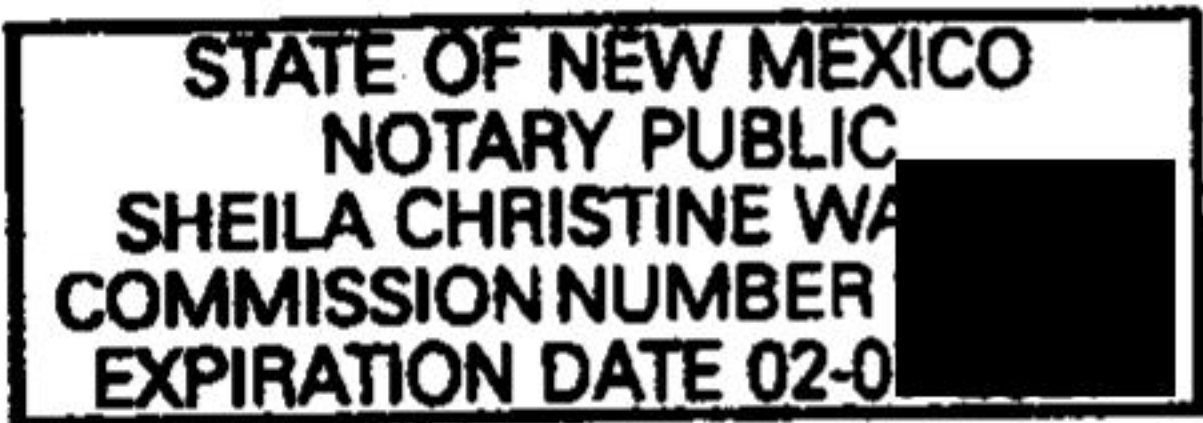
While crime lab cross-contamination events are somewhat rare events, the highly-regarded SWGDAM scientists make a multitude of references to “ventilation”, “air flow” and the vital importance of minimizing liquid “aerosols” that often occur during the processing of liquid DNA samples within any crime lab. Refer to **Pages 5-8** of the SWGDAM Guidelines on **Contamination Prevention/Detection (Exhibit 12)**. Similar to the mechanisms by which aerosols can be the cause of COVID viruses—mobilizing from victim to victim—DNA-containing liquid aerosols are a common mechanism by which traces of DNA can be mobilized during the crime lab processes of evidence handling, DNA extraction, DNA quantification, and typing. Crime lab managers and bench analysts are typically unaware of the gravity of these risks. This is primarily due to the fact that those handling these sources of DNA ***cannot see*** the molecules and liquid aerosols—similar to the way that the human eye is incapable of detecting infectious viruses. Finally, consider that the only DNA results suggesting Mr. Aranda’s possible role in any sexual crime were referred to by Dr. Shutler, in part, as “not as clear”, “something strange”, and “quirky”. As a consequence of all that has been summarized above, it is my opinion—as an experienced forensic DNA expert—***that the scientific results from this casework are defective and scientifically unreliable.***

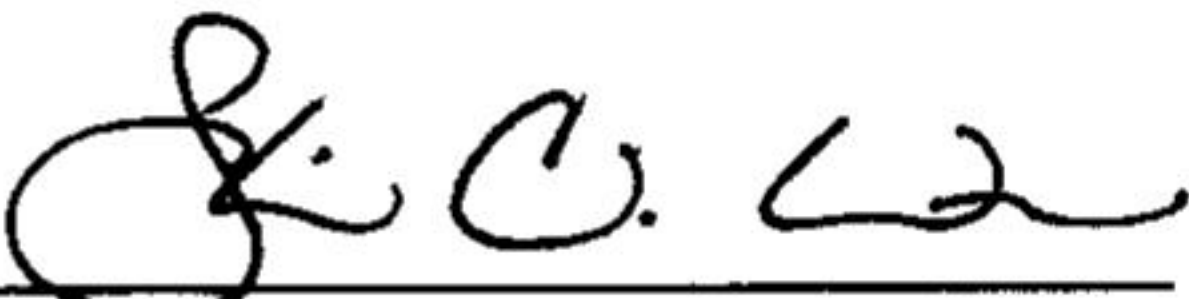
DATED this 3rd day of February, 2023,


MICHAEL J. SPENCE, PH.D

STATE OF NEW MEXICO)
) ss.
COUNTY OF DONA ANA)

SUBSCRIBED AND SWORN TO before me by Michael J. Spence, Ph.D., on this 3rd day of
~~December, 2022.~~
February, 2023




NOTARY PUBLIC

My Commission Expires: 02-07-2027